Air Quality Needs and Requirements to Reduce Mobile Source Emissions

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South Coast Air Quality Management District

Shared Enterprise: A New Concept for Investing in AFV Platform Development
8th National Clean Cities Conference and Expo
Oklahoma City, OK
May 12-15, 2002

Since 1950s

- Population -
  - 4.8 Million ↑ 15 Million
- Vehicles -
  - 2.3 Million ↑ 10.6 Million
- Peak Ozone Levels -
  - 0.68 ppm ↓ 0.19 ppm

Source: Los Angeles Times Syndicate

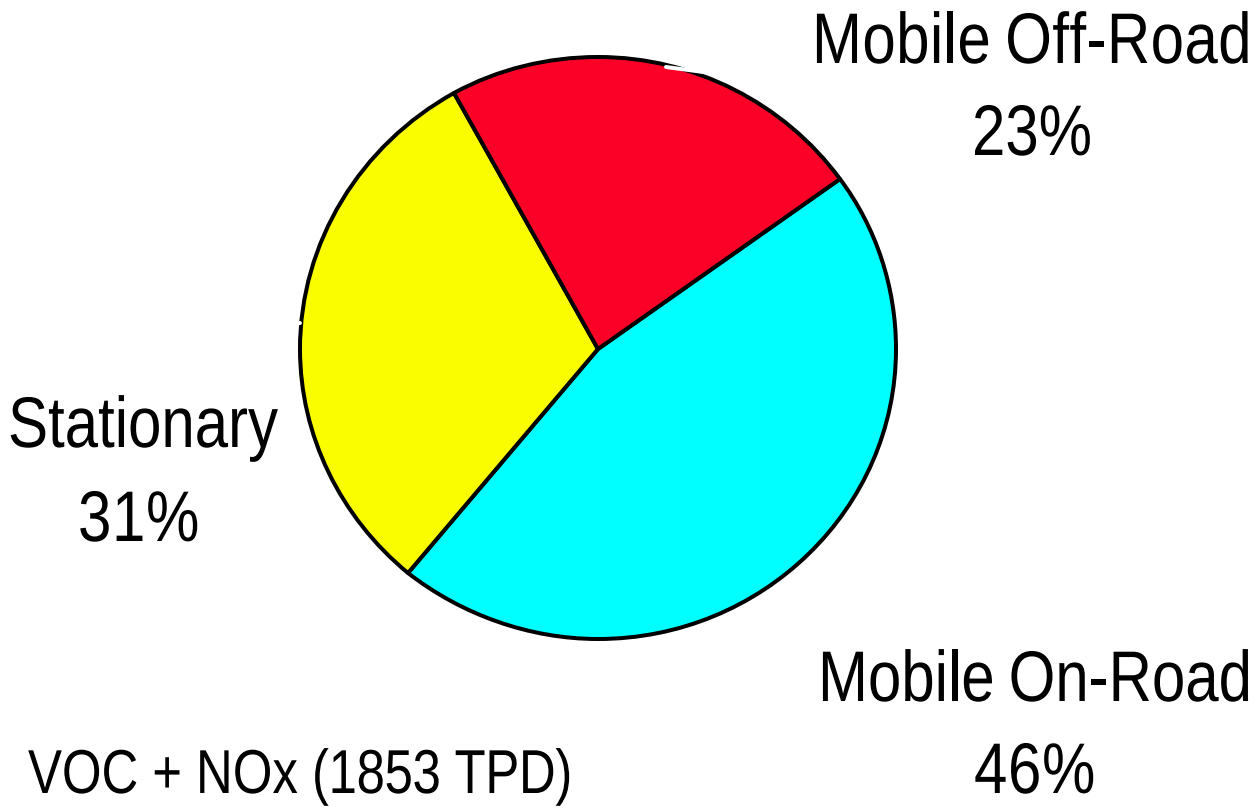
Ambient Air Quality Standards

- Federal:
  - CO - 2000
  - PM10 - 2006
  - 1-Hr Ozone - 2010
  - PM2.5 - ?
  - 8-Hr Ozone - ?
- State:
  - As Early As Practicable
  - Ozone Plans - 2003

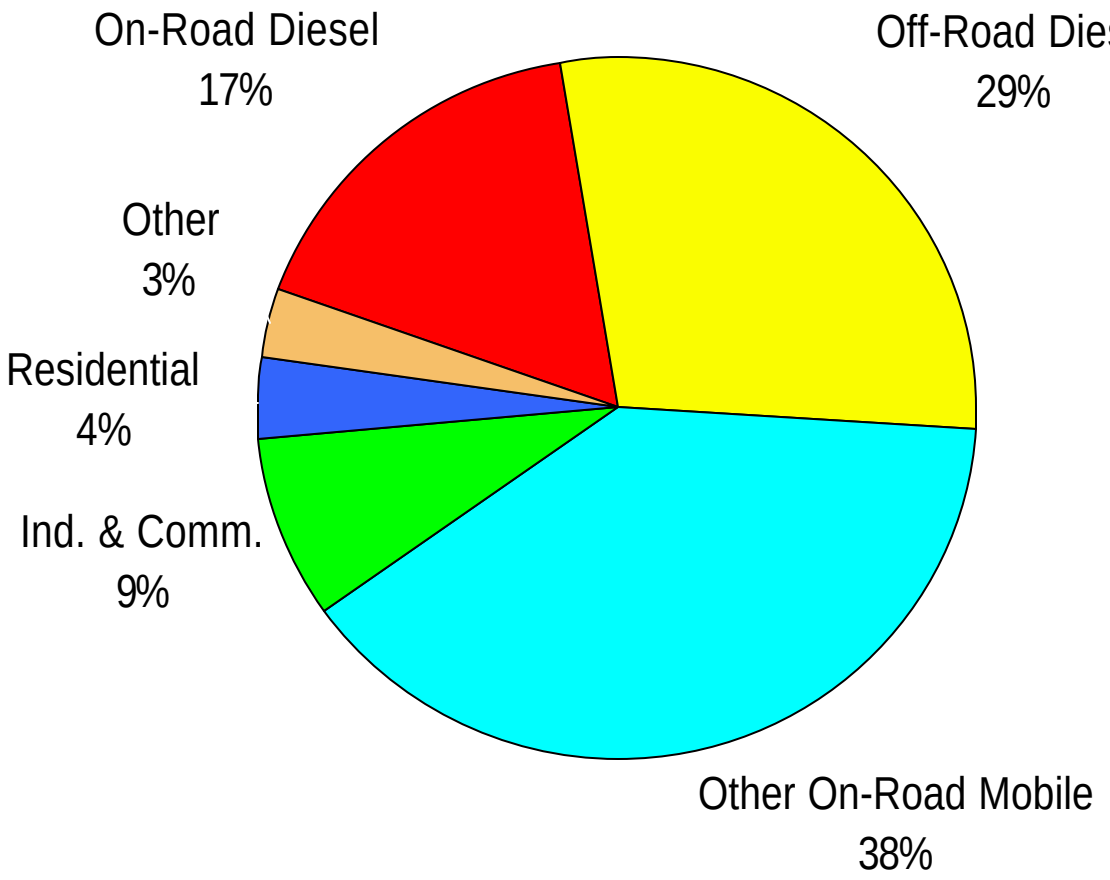
Public Health Issues

- Respiratory Disease - Acute/Chronic
  - Photochemical smog
  - Particulate matter
- Cancer Risk - Chronic Exposure
  - Toxic air emissions
- Children's Health

Ozone Related Emissions in the South Coast Air Basin

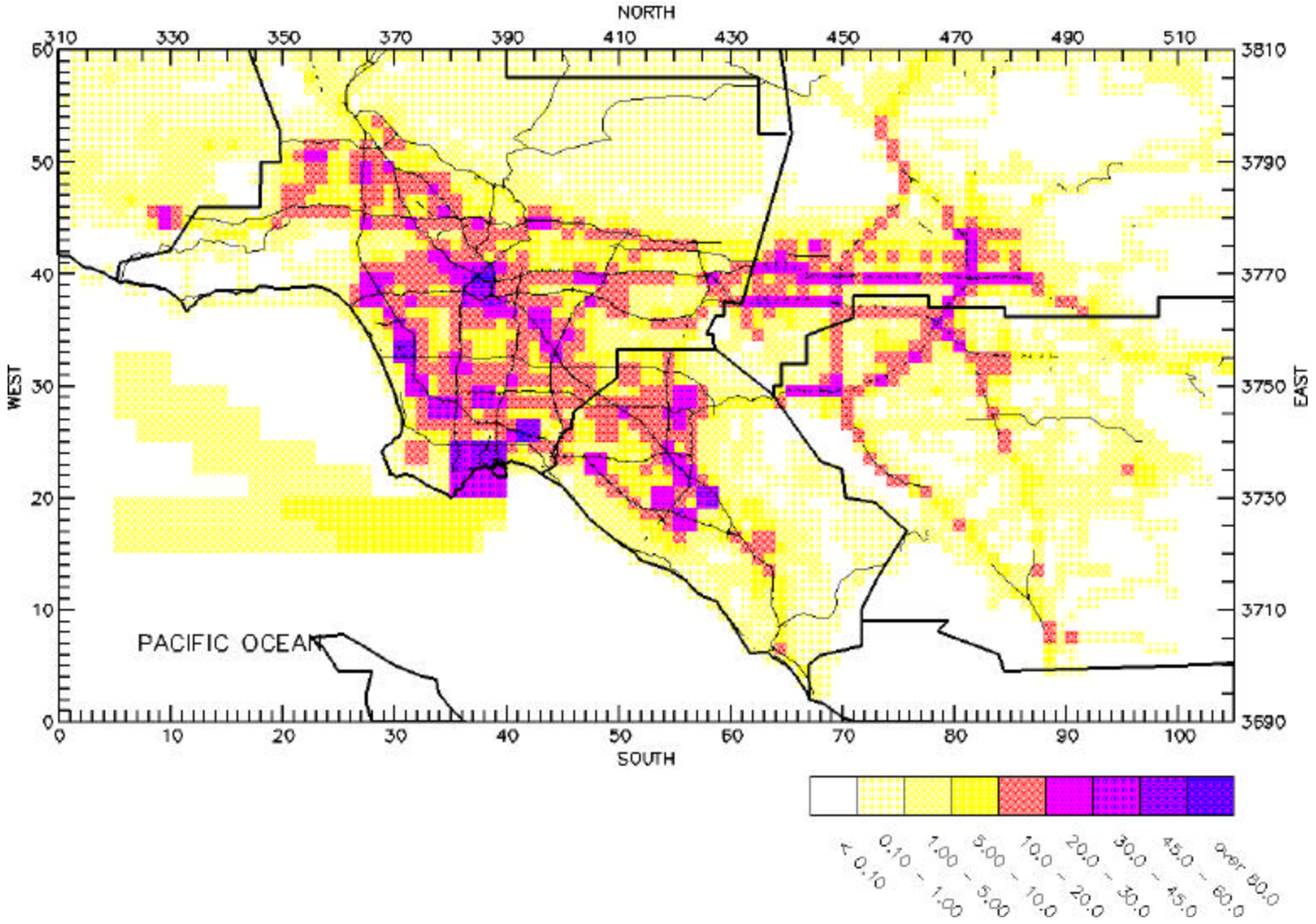


1999 SIP Estimated NOx Emissions



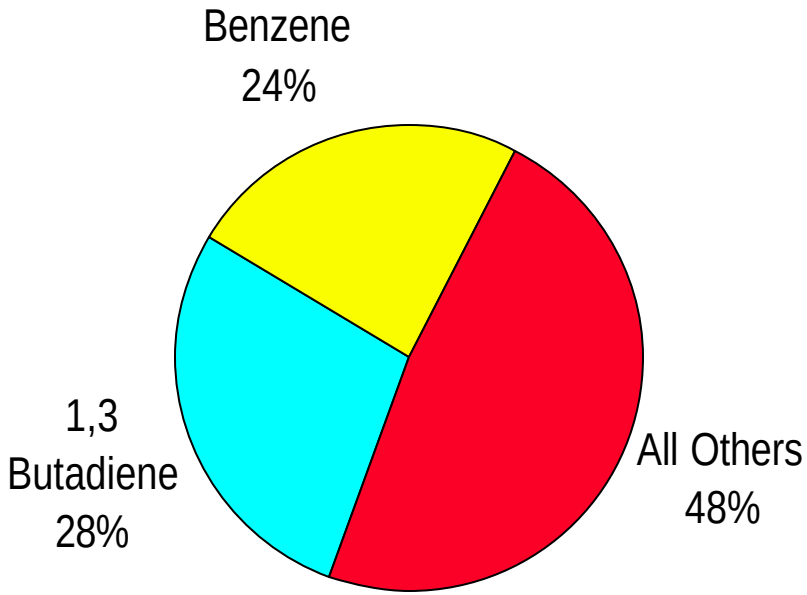
NOx (960 TPD)

Diesel Emissions in the South Coast Air Basin



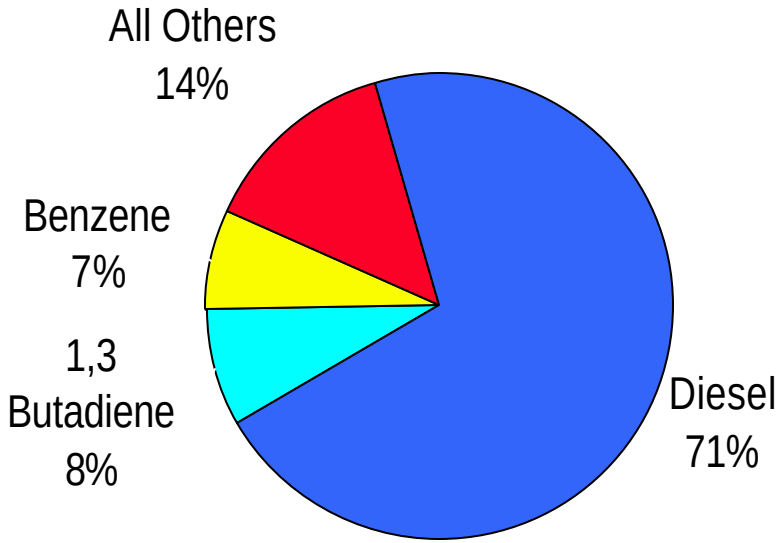
Cumulative Toxic Risk
South Coast Air Basin (1998-1999)

Without Diesel



406
in a million

With CA Diesel Toxicity



1,400
in a million

Mobile Source Emissions and Air Quality

- Disproportionate Contribution to NOx, $PM_{10}/PM_{2.5}$, and Toxic Emissions
- Special Challenge Due to Long Useful Life of Vehicles/Equipment
- New Cleaner Engines - One Part of Solution
- Need to Clean Up Existing Engines - Second Part of Solution
- Local Needs Versus National Needs

Need for Clean Vehicle Fleet Rules

- Significant Contributors to Localized and Regionwide Air Toxic Exposures
- Reduce Emissions as Early as Possible
- Accelerate Cleaner Engine Technology Development

Fleet Rule Construct

- Purchase Cleanest Vehicles Available
- Alternative Fuel Application Niches
- Need for Feasible Implementation
- Long-Term Perspective

SCAQMD Fleet Vehicle Rules

- 1191 - Light- and Medium-Duty Public Fleets
- 1192 -Transit Buses
- 1193 - Refuse Collection Vehicles
- 1194 - Commercial Airport Ground Access
- 1195 - School Buses
- 1196 - Heavy-Duty Public Fleet Vehicles
- 1186.1 - Less-Polluting Sweepers









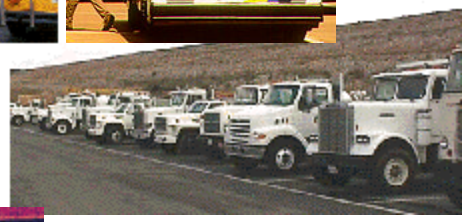
Alternative Fuel Vehicle Applications

- Most Widely Available Alt. Fuel Engines
  - Propane
  - Natural Gas


- Natural Gas:
  ~ 2500 Transit Buses
  ~ 200 School Buses
  ~ 200 Refuse Trucks
  ~ 300 Taxicabs




- Propane:
  ~ 100 Light- & Medium-Duty Vehicles
  ~ 20 Streetsweepers




Platform Development

- Alternative Fuel Engines Not Available for All Vehicle Applications
- Need to Accelerate Alternative Fuel Engine Design/Development
- Focus on Vehicles that Most Affect Public Health

Platform Development Focus

- Light- and Medium-Duty Vehicles
- Mid-Size School Buses
- Mid-Size Refuse Trucks
- Heavy-Duty Vehicles

Challenges

- Vehicle Cost Premiums
- Vehicle Performance Issues (especially range)
- Refueling Infrastructure (expansion/reliability)
- Competing Gasoline and Diesel Prices
- Limited Market Development Resources

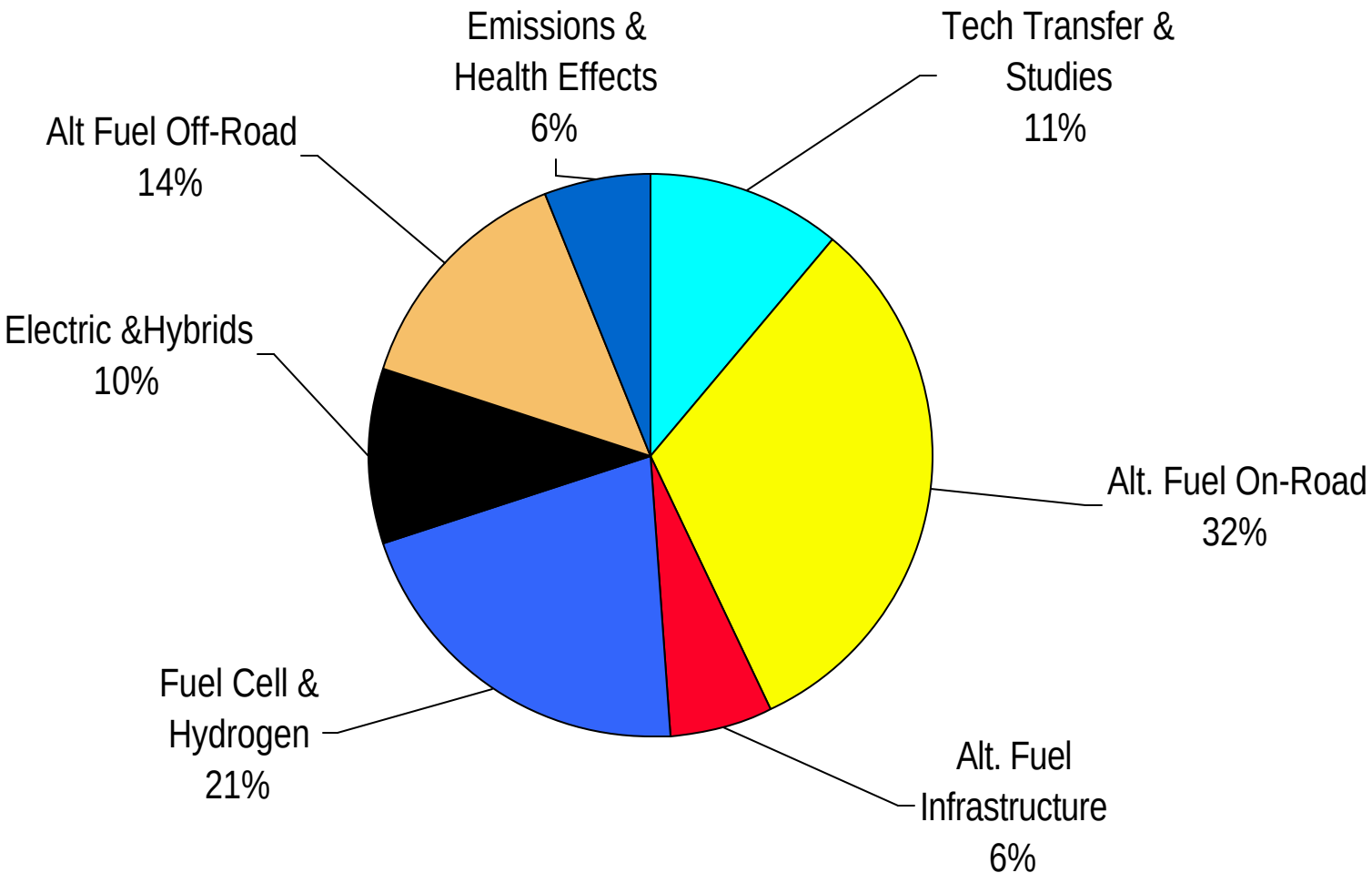
Market Requirements

- Improved Vehicle Performance and Reliability
- Reduced Costs Across the Board
- More Favorable Fuel Cost Comparisons
- Increased Fuel Availability

SCAQMD Technical Area Priorities

- Diesel Alternatives - Clean Alternative Fuels in Heavy-Duty Engine Applications
- Electric and Hybrid Electric Technologies
- Off-Road Applications of Alternative Fuels
- Fuel Cells for Transportation and Stationary Applications

2001 SCAQMD Clean Fuels Research and Demonstration Funding



Current SCAQMD RD&D Project Highlights

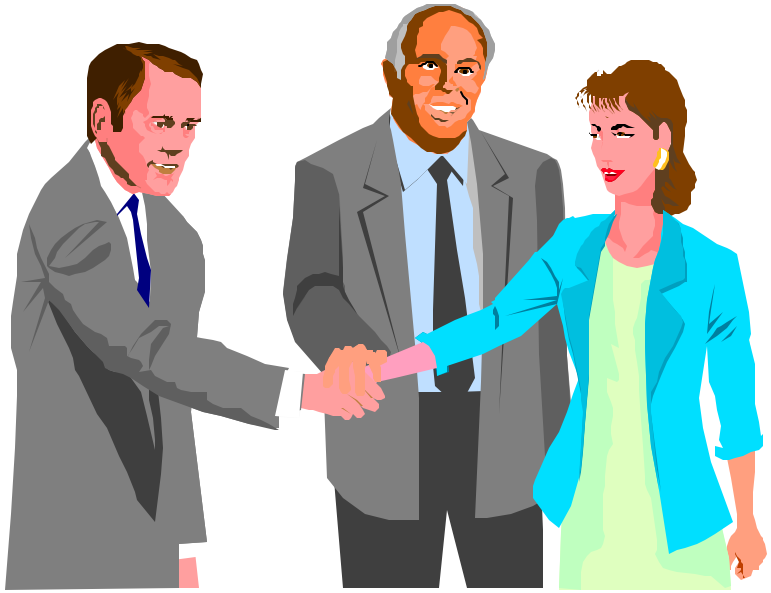
- Mid-Size Natural Gas School Bus
- 0.5 g/bhp-hr NOx Heavy-Duty Engine
- Mid-Size Engine for Class 3-6 Vehicles Meeting Long- and Near-Term NOx Emission Standards
- Natural Gas Homogeneous Charging Combustion Ignition (HCCI) Engine
- CNG Fueling Station to Hydrogen Fueling Conversion

Research Activities

- Next Generation NGV (NGNGV) Projects
  - (2) Cummins/Westport Studies to Develop Low NOx Natural Gas Engines < 0.5 g/bhp-hr
  - CAP/BKM - Dual Fuel - 0.5 and 0.2 g/bhp-hr
- AQMD - After-Treatment Control Devices for Natural Gas Engines
- AQMD/DOE - Platform Development

Road to Success

- Working Together (Public/Private Partnerships)
- Consultative Process
- Public Outreach/ Education
- Secure Long-Term Funding Assistance for Cleaner Technologies




FROM SMOG TO FOG.
DAILY.
NONSTOP TO LONDON
AIR NEW ZEALAND